

AIR AND WEATHER MODULE MATRIX

SYNOPSIS

CA SCIENCES STANDARDS

CA I&E STANDARDS

1. EXPLORING AIR

Students explore properties of a common gas mixture, air. Using vials, syringes, and tubes, students experience air as matter, discovering that it takes up space and can be compressed and that compressed air builds up pressure that can push objects around. They construct and compare parachutes and balloon rockets. Students read about air and where it's found.

PS1a Solids, liquids, and gases have different properties.

I&E4a Draw pictures of the thing being described.

I&E4b Record observations and data with pictures, numbers, or written statements.

I&E4d Describe the relative position of objects by using two references.

I&E4e Make new observations when discrepancies exist.

2. OBSERVING WEATHER

Students record weather for 4–8 weeks on a class calendar and in weather journals. They measure temperature with a thermometer and rainfall with a rain gauge. They learn to identify three basic cloud types by matching their observations to a cloud chart. Students read about different kinds of weather.

ES3a Use simple tools to measure weather conditions and record changes.

I&E4a Draw pictures of the thing being described.

ES3b The weather changes from day to day, but trends tend to be predictable during a season.

I&E4b Record observations and data with pictures, numbers, or written statements.

ES3c The Sun warms the land, air, and water.

I&E4d Describe the relative position of objects by using two references.

3. WIND EXPLORATIONS

Students look for evidence of moving air. They observe and describe wind speed using pinwheels, an anemometer, and a wind scale. They observe bubbles and construct wind vanes to find the wind's direction. Flying kites, they feel the strength of the wind and its direction. Students read how meteorologists gather information on the weather.

ES3a Use simple tools to measure weather conditions and record changes.

I&E4b Record observations and data with pictures, numbers, or written statements.

4. LOOKING FOR CHANGE

Students organize monthly weather data, using graphs to describe weather trends. They continue to measure and record weather throughout the year, to compare the seasons. Students read about the seasonal weather patterns.

ES3b The weather changes from day to day, but trends tend to be predictable during a season.

I&E4b Record observations and data with pictures, numbers, or written statements.

ES3c The Sun warms the land, air, and water.

I&E4c Record observations on a bar graph.

- Air is matter.
- Air takes up space.
- Air interacts with objects.
- Air resistance affects how things move.
- Air is all around objects.
- Air can be compressed.
- The pressure from compressed air can move things.
- Air is a gas.

- *FOSS Science Resources: Air and Weather, "What Is All around Us?"*
- Science Notebook: Students draw and write their observations about air.

- Preassessment**
Teacher Observation/Notebook Sheet
- Observes and records where air is when an empty vial is placed under water.
 - Observes and reports how air affects a parachute's descent.
 - Observes and records how air can be compressed and how it can make things move.

- Weather describes conditions in the outside air and changes over time.
- The sun warms the land, air, and water.
- Temperature, precipitation, and cloud types are components of the weather that can be described.
- Meteorologists are scientists who study weather.
- There are different kinds of clouds.
- Rain is water that comes from clouds.

- *FOSS Science Resources: Air and Weather, "What's the Weather Today?"*
- Science Notebook: Students draw and write about the weather conditions. They use data from the class meteorologist to write their reports.

- Teacher Observation/Notebook Sheet**
- Makes objective observations of weather and describes them in drawings and words.
 - Uses tools to monitor weather, including a thermometer, cloud pictures, and rain gauges.
 - Reports weather conditions, including temperature, cloud type, and rainfall.

- Wind is moving air.
- Wind speed and wind direction are components of weather that can be measured with anemometers and wind vanes.
- Wind scales are tools used to describe the speed of the wind.

- *FOSS Science Resources: Air and Weather, "Understanding the Weather"*
- Science Notebook: Students draw and write about the weather conditions. They use data from the class meteorologist to write their reports.

- Teacher Observation/Notebook Sheet**
- Makes objective observations of weather and describes them in drawings and words.
 - Uses tools to monitor weather, including an anemometer and wind vanes.
 - Understands how knowing about wind speed and direction helps to fly kites.

- Weather conditions change over time.
- Weather observations can be organized, compared, and predicted.
- The Sun heats the Earth during the day.
- Each season has a typical weather pattern that can be observed, compared, and predicted.

- *FOSS Science Resources: Air and Weather, "Seasons"*
- Science Notebook: Students write about the seasons and make bar graphs using weather data for 4 weeks.

- Teacher Observation/Notebook Sheet**
- Accurately records observations.
 - Uses symbols to create a bar graph of weather conditions, using class data from the past month.
 - Writes about the weather conditions for a particular season.

End-of-Module Assessment



FOSS AND CALIFORNIA STANDARDS

The **Air and Weather Module** supports the following Physical and Earth Sciences Content Standards for grade 1.*

PS1 *Materials come in different forms (states), including solids, liquids, and gases.*

As a basis for understanding this concept, students know

PS1a solids, liquids, and gases have different properties.

ES3 *Weather can be observed, measured, and described.*

As a basis for understanding this concept, students know

ES3a how to use simple tools (e.g., thermometer, wind vane) to measure weather conditions and record changes from day to day and across the seasons.

ES3b that the weather changes from day to day but that trends in temperature or of rain (or snow) tend to be predictable during a season.

ES3c the Sun warms the land, air, and water.

The **Air and Weather Module** supports the following Investigation and Experimentation Content Standards for grade 1.*

INVESTIGATION AND EXPERIMENTATION

I&E4 *Scientific progress is made by asking meaningful questions and conducting careful investigations.*

As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will

I&E4a draw pictures that portray some features of the thing being described.

I&E4b record observations and data with pictures, numbers, or written statements.

I&E4c record observations on a bar graph.

I&E4d describe the relative position of objects by using two references (e.g., above and next to, below and left of).

I&E4e make new observations when discrepancies exist between two descriptions of the same object or phenomenon.

**Science Content Standards for California Public Schools: Kindergarten through Grade Twelve (Sacramento: California Department of Education, 2000).*

PLANTS AND ANIMALS MODULE MATRIX

SYNOPSIS	CA LIFE SCIENCES STANDARDS	CA I&E STANDARDS
<p>1. GRASS AND GRAIN SEEDS</p> <p>Students plant miniature lawns with rye grass and alfalfa. They mow the lawns and observe the response of grass and alfalfa to cutting. They plant individual wheat seeds in clear soda straws and observe how grain seeds germinate and grow. They read about plant needs and view a video on how plants grow.</p>	<p>LS2b Both plants and animals need water, animals need food, and plants need light.</p> <p>LS2c Animals eat plants or other animals and may use them for shelter and nesting.</p> <p>LS2e Roots take in water and soil nutrients, and green leaves make food from sunlight.</p>	<p>I&E4a Draw pictures of the thing being described.</p> <p>I&E4b Record observations and data with pictures, numbers, or written statements.</p> <p>I&E4c Record observations on a bar graph.</p> <p>I&E4d Describe the relative position of objects by using two references.</p> <p>I&E4e Make new observations when discrepancies exist.</p>
<p>2. STEMS</p> <p>Students make new plants from stems of houseplants. They put sections of stems from mints and other plants into water and look for evidence that a new plant is forming. Stem pieces that develop roots are planted to make new plants. Students plant pieces of potatoes (modified stems) and observe them grow. They learn about how plants make food. Students read about seed dispersal.</p>	<p>LS2b Both plants and animals need water, animals need food, and plants need light.</p> <p>LS2e Roots take in water and soil nutrients, and green leaves make food from sunlight.</p>	<p>I&E4a Draw pictures of the thing being described.</p> <p>I&E4b Record observations and data with pictures, numbers, or written statements.</p>
<p>3. TERRARIUMS</p> <p>Students set up terrariums using seeds and plants from Investigations 1 and 2. They add local animals such as snails, isopods, and worms and provide for the needs of the plants and animals. They learn about other animals and plants through readings and multimedia.</p>	<p>LS2a Different plants and animals inhabit different environments and thrive in different places.</p> <p>LS2b Both plants and animals need water, animals need food, and plants need light.</p> <p>LS2c Animals eat plants or other animals and may use them for shelter and nesting.</p>	<p>I&E4a Draw pictures of the thing being described.</p> <p>I&E4b Record observations and data with pictures, numbers, or written statements.</p> <p>I&E4d Describe the relative position of objects by using two references.</p>
<p>4. BULBS AND ROOTS</p> <p>Students plant onion bulbs or garlic cloves in moist cotton and observe as they develop into new plants. They plant parts of roots—carrots and radishes—to discover which parts will develop into new plants. Through a reading, they learn about the shape and functions of different kinds of teeth, and use their own teeth to eat a carrot.</p>	<p>LS2b Both plants and animals need water, animals need food, and plants need light.</p> <p>LS2d What animals eat can be inferred from the shapes of their teeth.</p> <p>LS2e Roots take in water and soil nutrients, and green leaves make food from sunlight.</p>	<p>I&E4a Draw pictures of the thing being described.</p> <p>I&E4b Record observations and data with pictures, numbers, or written statements.</p> <p>I&E4d Describe the relative position of objects by using two references.</p>

CONCEPTS

- Seeds are alive.
- Seeds need water and light to grow into new plants.
- Some plants die and some plants continue to grow after they are mowed.
- Plants have different structures that function in growth and survival.
- Wheat and other cereals that we eat come from seeds called grains.

- New plants can grow from stems of mature plants.
- Plants need water and light to grow.
- Leaves, twigs, and roots develop on stems at the nodes.
- Potatoes are underground stems.
- Seeds have structures to help them travel to new locations to grow.
- Plants make their own food, using sunlight.

- A terrarium is a place where plants and animals live in soil.
- A habitat is a place where plants and animals live. There are many different kinds of habitats.
- Plants and animals have structures and animals have behaviors that help them live in their habitat.
- Changes in a terrarium happen over time and can be recorded.

- Bulbs are alive.
- Bulbs need water to start growing.
- Parts of roots will grow into new plants. Other parts will not.
- Animals eat plants.
- Animal teeth come in different shapes and sizes and are used to capture and eat different kinds of food.

LANGUAGE DEVELOPMENT

- *FOSS Science Resources: Plants and Animals*, “What Do Plants Need?” and “The Story of Wheat”
- Science Notebook: Students draw and write about seed and plant growth. They draw and label using numbers and words.

- *FOSS Science Resources: Plants and Animals*, “How Seeds Travel”
- Science Notebook: Students draw changes in the stem cuttings and caption their drawings. They write about how seeds travel.

- *FOSS Science Resources: Plants and Animals*, “What Do Animals Need?” and “Plants and Animals around the World”
- Science Notebook: Students draw a map showing the locations of plants in their terrarium. They record changes over time.

- *FOSS Science Resources: Plants and Animals*, “Animal Teeth”
- Science Notebook: Students draw and label their growing bulb.

ASSESSMENT

Preassessment (optional)

Teacher Observation/Notebook Sheet

- Observes that some plants grow back if they are cut.
- Sequences drawings of observations.
- Compares leaves and roots and explains why they grow in predictable directions.

Teacher Observation/Notebook Sheet

- Makes accurate observations and describes them in drawings and with words.
- Compares the structures of potato plants to other plants they have grown.

Teacher Observation/Notebook Sheet

- Builds a terrarium and knows what plants and animals need to live in it.
- Maps locations of seeds and plants in the terrarium and records changes over time.
- Matches plants and animals to their habitat, based on their structures and behaviors.

Teacher Observation/Notebook Sheet

- Accurately records observations.
- Demonstrates a basic understanding of the needs of plants and can name structures and functions.

End-of-Module Assessment



FOSS AND CALIFORNIA STANDARDS

The **Plants and Animals Module** supports the following Life Sciences Content Standards for grade 1.*

LIFE SCIENCES

LS2 *Plants and animals meet their needs in different ways.*

As a basis for understanding this concept, students know

- LS2a different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.
- LS2b both plants and animals need water, animals need food, and plants need light.
- LS2c animals eat plants or other animals for food and may also use plants or even other animals for shelter and nesting.
- LS2d how to infer what animals eat from the shapes of their teeth (e.g., sharp teeth: eats meat; flat teeth: eats plants).
- LS2e roots are associated with the intake of water and soil nutrients and green leaves are associated with making food from sunlight.

The **Plants and Animals Module** supports the following Investigation and Experimentation Content Standards for grade 1.*

INVESTIGATION AND EXPERIMENTATION

I&E4 *Scientific progress is made by asking meaningful questions and conducting careful investigations.*

As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will

- I&E4a draw pictures that portray some features of the things being described.
- I&E4b record observations and data with pictures, numbers, or written statements.
- I&E4c record observations on a bar graph.
- I&E4d describe the relative position of objects by using two references (e.g., above and next to, below and left of).
- I&E4e Make new observations when discrepancies exist between two descriptions of the same object or phenomenon.

**Science Content Standards for California Public Schools: Kindergarten through Grade Twelve* (Sacramento: California Department of Education, 2000).

SOLIDS AND LIQUIDS MODULE MATRIX

SYNOPSIS

CA PHYSICAL SCIENCES STANDARDS

CA I&E STANDARDS

1. SOLIDS

Students explore solid objects, such as pieces of wood, plastic, and metal. They observe, describe, and sort the objects according to their properties. They construct towers (and other structures), using the properties inherent in the materials to accomplish the task.

PS1a Solids, liquids, and gases have different properties.

I&E4a Draw pictures of the thing being described.

I&E4b Record observations and data with pictures, numbers, or written statements.

2. LIQUIDS

Students investigate liquids in a variety of settings to become familiar with their properties. They play games to rehearse precise liquids vocabulary. Students use representational materials to enhance their understanding of the unique behaviors of liquids.

PS1a Solids, liquids, and gases have different properties.

I&E4b Record observations and data with pictures, numbers, or written statements.

I&E4c Record observations on a bar graph.

3. BITS AND PIECES

Students work with beans, rice, and cornmeal to find out how solids behave when the pieces are small. They shake, rattle, and roll the materials in bottles, pour them from container to container, and separate them using screens.

PS1a Solids, liquids, and gases have different properties.

I&E4b Record observations and data with pictures, numbers, or written statements.

I&E4c Record observations on a bar graph.

4. SOLIDS AND LIQUIDS WITH WATER

Students investigate interactions between solids and water and liquids and water. They observe, describe, record, and organize the results. They test toothpaste to determine if it is a solid or a liquid. They investigate melting and freezing of familiar liquids.

PS1a Solids, liquids, and gases have different properties.

PS1b Properties of substances can change when the substances are mixed, cooled, or heated.

I&E4a Draw pictures of the thing being described.

I&E4b Record observations and data with pictures, numbers, or written statements.

I&E4c Record observations on a bar graph.

I&E4e Make new observations when discrepancies exist.

- Solids are one state of matter.
- Solid materials have properties that separate them from other states of matter.
- Solids can be sorted by their properties.
- Solid materials have distinct uses, based on their properties.

- *FOSS Science Resources: Solids and Liquids, "Everything Matters"*
- Science Notebook: Students draw and write about solids. They draw and label their tower constructions.

Preassessment (optional)

Teacher Observation/Notebook Sheet

- Identifies properties of solid objects and sorts objects based on a property.
- Compares different solids.
- Identifies properties of a solid used for specific purposes in construction.

- Liquids are one state of matter.
- Liquids have many properties.
- Liquids pour and flow.
- Liquids take the shape of their container.
- The surface of liquid is level with respect to the ground.

- *FOSS Science Resources: Solids and Liquids, "Solids and Liquids"*
- Science Notebook: Students draw and write about liquids and their properties. They use prepared sheets to record observations and respond to writing prompts. They make a bar graph indicating the number of vials of water it takes to fill four different containers.

Teacher Observation/Notebook Sheet

- Describes observations.
- Uses new vocabulary accurately.
- Draws liquids taking the shape of their container.
- Observes that the liquid surface remains level as the bottle tips.

- Solid materials come in all sizes and shapes.
- Particles of solid materials can pour like liquids, but maintain their shape.
- Solid materials can support denser materials on their surface.
- Mixtures of solid particles can be separated with a screen.

- Science Notebook: Students draw and write about small solids and their properties. They record which screen is used to separate each material.

Teacher Observation/Notebook Sheet

- Compares properties of solids and liquids.
- Chooses screens of appropriate size to separate solids.

- Some solids change when mixed with water; others do not.
- Some solids dissolve in water; evaporation leaves the solid behind.
- Some liquids mix with water; other liquids form a layer above or below water.
- Heating and cooling solids and liquids can change them from one state to another.

- *FOSS Science Resources: Solids and Liquids, "Mix It Up!" and "Solids to Liquids and Back Again"*
- Science Notebook: Students record the results of mixing solids and liquids with water. They make a bar graph of the results.

Teacher Observation/Notebook Sheet

- Accurately records observations.
- Supports opinions with evidence.

End-of-Module Assessment



FOSS AND CALIFORNIA STANDARDS

The **Solids and Liquids Module** supports the following Physical Sciences Content Standards for grade 1.*

PHYSICAL SCIENCES

PS1 *Materials come in different forms (states), including solids, liquids, and gases.*

As a basis for understanding this concept, students know

- PS1a solids, liquids, and gases have different properties.
- PS1b the properties of substances can change when the substances are mixed, cooled, or heated.

The **Solids and Liquids Module** supports the following Investigation and Experimentation Content Standards for grade 1.*

INVESTIGATION AND EXPERIMENTATION

I&E4 *Scientific progress is made by asking meaningful questions and conducting careful investigations.*

As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will

- I&E4a draw pictures that portray some features of the things being described.
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